

APPENDIX - Methods

Under the Tackling Deadly Diseases in Africa Programme (TDDAP), a collaboration between WHO and the UK's Department for International Development (now part of the Foreign, Commonwealth & Development Office (FCDO)), we conducted systematic searches of four bibliographic databases (IBSS, Scopus, MEDLINE and Web of Science), and a grey literature search and document analysis.

Academic/peer-reviewed literature search

1. A landscape scan of the literature was conducted, using academic search engines and recommendations from academic and WHO colleagues with expertise in the research area.
2. Based on this, notes were taken relating to:
 - a. Keywords used in the literature; and
 - b. Other referenced literature referred to that may be relevant and worthy of follow-up.
3. Keywords were generated based on the scoping review, research question and objectives.
4. Four bibliographic databases were searched (IBSS, Scopus, MEDLINE, Web of Science)
 - a. Records were identified;
 - b. Key concepts, topics and findings were highlighted;
 - c. Alternative keywords, American vs British spellings, MeSH (medical subject headings) terms were considered; and
 - d. Final search terms and search strings were compiled.

Search terms

The following keywords and Boolean operators were used in conducting literature searches in the four bibliographic databases during April-June 2019:

("public health institute" OR "public health institutes" OR "public health institution" OR "public health institutions" OR "public health agency" OR "national public health institute" OR "national public health institutes" OR "national public health institution" OR "national public health institutions" OR "institut national de santé publique" OR "centre for disease control") OR ("academic institute" OR "academic institutes" OR "academic institution" OR "academic institutions" OR "public health school" OR "public health schools" OR "university" OR "universities" OR "research institute" OR "research institutes" OR "research institution" OR "research institutions")

AND

("health system strengthening" OR "health system resilience" OR "global health security" OR "health security" OR "six building blocks" OR "emergency preparedness and response" OR

“emergency preparedness” OR “essential public health functions” OR “essential public health operations” OR “essential public health services” OR “outbreaks” OR “pandemics” OR “epidemics” OR “public health emergency” OR “international health regulations” OR “international health regulations 2005”)

AND/OR

(“Africa” OR “African country” OR “West Africa” OR “Sub-Saharan Africa” OR “Northern Africa” OR “Africa South of the Sahara” OR “Central Africa” OR “Eastern Africa” OR “Southern Africa” OR “Western Africa”)

Grey literature

Using the above search terms, and their combinations, additional documents, reports and other relevant sources of evidence were searched and recorded. Grey literature and policy resources searched include the WHO’s Institutional Repository (Iris), WHO, World Bank, IANPHI, World Federation of Public Health Association (WFPHA), US CDC, African CDC, African MoH (Ministry of Health)/NPHI and Google Scholar websites.

Reference lists

The reference lists of included articles and documents were scanned for further evidence sources – commonly referred to as ‘snowballing’.

Inclusion and Exclusion Criteria

All categories of peer-reviewed publication (empirical studies, reviews, commentaries, letters, opinions, debates, reflections, etc) were included. Sources from francophone and lusophone countries, due to historic roots of institutes/MoH, were included and abstract/full-text English translations were searched for. No year limit was set. Articles were reviewed for eligibility depending on content and relevance to research question and objectives. Sources were included if they:

- contained data, information or analysis relating to the role of public health institutes in EPHFs and/or HSS; and
- related to one or more low-and middle-income countries in Africa.

Sources were excluded if they:

- focused on a single disease or vertical programme;
- related to single clinical/pharmaceutical/health product/biomedical interventions; or
- related to a non-African country.

PRISMA flow diagram of search strategy and outcome

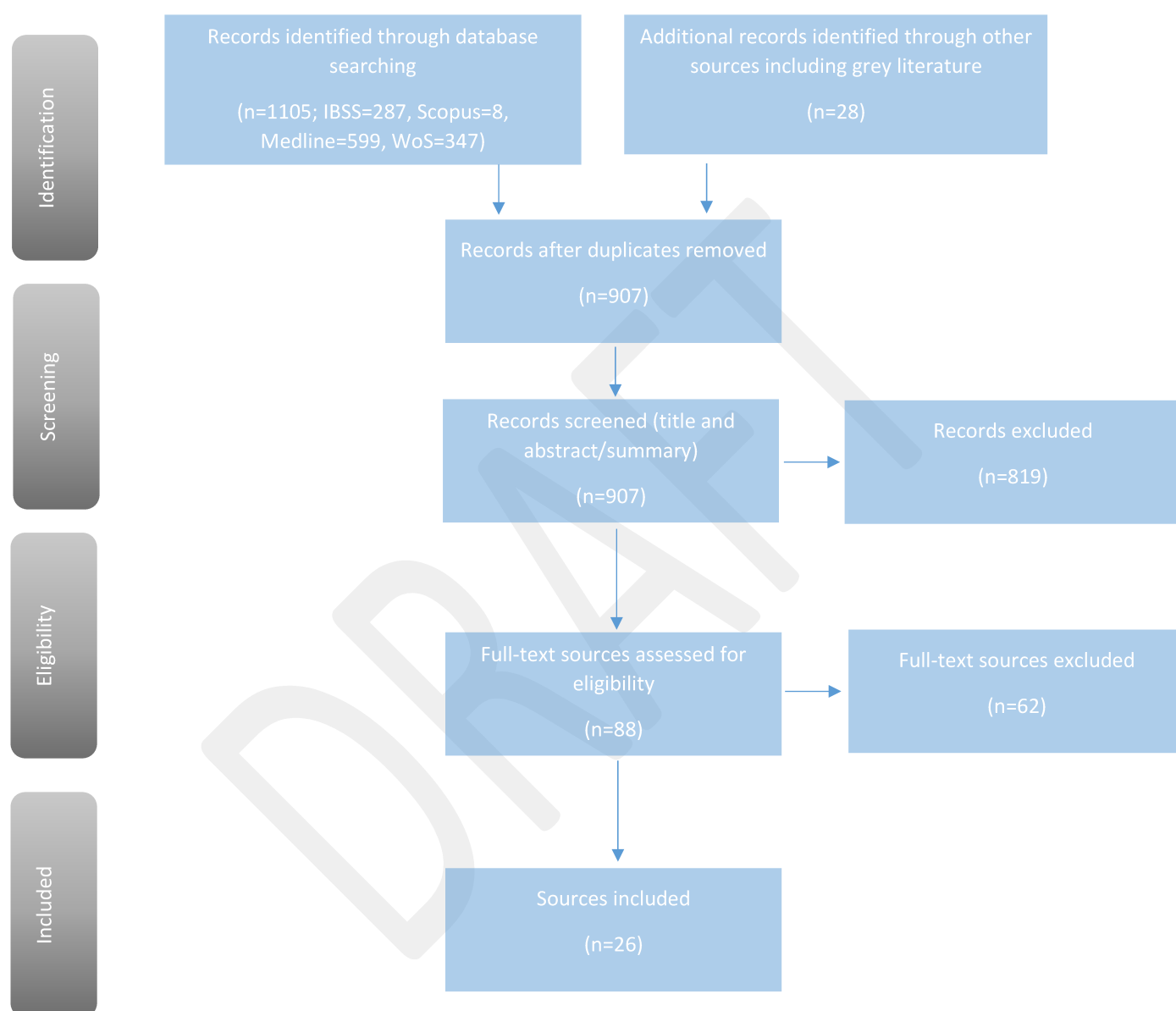


Figure 1. The PRISMA flow diagram above represents the search strategy and outcomes deployed in the literature review underpinned by systematic and replicable methods.

Essential Public Health Functions and Health System Strengthening

The rationale for appraisal of NPHI and WCC against EPHFs is that they cover both necessary health security and routine activities expected of a resilient health system. Further, IANPHI compiled their 'functions of an NPHI' based on WHO PAHO. Involvement against a HSS framework was deemed necessary to ascertain institute role and impact in health system-wide activities. WHO's six HSS building blocks framework was chosen as it is better recognised relative to others such as the WHO framework for health systems performance assessment and the World Bank's control knobs framework. It is widely acknowledged that there is a need to unify health systems monitoring and evaluation taxonomies to avoid duplication, confusion and reduce costs. Furthermore, monitoring using the building blocks of health systems has gained eminence through collaborative input from various health actors, including the World Bank; the Global Fund to Fight Aids, Tuberculosis and Malaria; the United Nations Children's Fund (UNICEF); and Gavi, the Vaccine Alliance. Although there are conceptual similarities between EPHF frameworks and WHO's HSS building blocks, notable differences exist including the inclusion of 'social mobilisation and participation', and 'promotion of health and health equity' as explicit functions within EPHF frameworks but not within the building blocks. These were considered important in the context of NPHI involvement in health policy, systems and resilience. Appraisal was based on available evidence from institute/government websites and limited peer-reviewed literature and therefore results should be interpreted as such.

Critical and Bibliographic Analysis

A structured process was followed to determine the relevance, strengths and weaknesses of the studies and data sources in answering the research question and meeting the objectives of this study.

The data sources used to map institutes and compile databases were appraised for reliability, authenticity and gaps due to, for example, paucity of data collection and research infrastructure, regional socio-political instability, and misreporting. Articles within the academic literature review were categorised as review, discussion/commentary/opinion or empirical studies, and then appraised for relevance, context-specificity, bias and methodological limitations. Similarly, sources of grey literature, such as policy documents and reports, were categorised as technical or policy brief, press release, and review report and were critically appraised for content, including strengths and limitations, author affiliations, and funding sources.